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however complex it is and at whatsoever cost to us the knowledge of it is to be attained, before we can grasp the true picture of the succession of events which have resulted in man as we now find him on the different lands of the globe. With the thinking minds of our race, the question of the origin of man is the question of the century.

The hypotheses as to the manner in which the early peoplings of America were effected, developed in the present and previous papers of mine, are as follows: —

(1.) That during the Tertiary period man had spread from Equatorial lands on the eastern hemisphere to Northern Asia, and had then crossed into America from the North.

(2.) That in at least as early as Pliocene time man had migrated down the high lands adjacent to the mountainous backbone running along the western side of the two Americas.

(3.) That the Ice-period produced a race modification of the man living in the extreme north, and that the advance of the ice prevented further communication between the Old and the New Worlds until comparatively recent times.

(4.) That this race accompanied the great glacier on its advance and retirement over North American territory, and that the existing representatives of this race are the Eskimos.

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THE POLAR COLONIZATION PLAN.

BY CAPT. H. W. HOWGATE, U. S. N.

THE expeditions of Captain Hall in the Polaris, in 1871, and of Captain Nares in the Alert and Discovery, in 1875, have shown that by the use of steam it is a comparatively easy matter to reach the entrance to Robeson's Channel in latitude 81° north, and that the serious difficulties to be overcome in reaching the Pole lie beyond that point. Parties from the two expeditions have made fair surveys one hundred and forty miles north of this, leaving only about four hundred miles of unexplored region between that and the goal of modern geographers, — the Pole.

When Captain Hall reached the upper extremity of Robeson's Channel the lookout of the Polaris reported open water in sight and just beyond the pack which surrounded the vessel and prevented further progress. This open water was afterwards seen from the cape at the northern opening of Newman's Bay, and it was the opinion of the crew of that ill-fated vessel that if she had been but the fraction of an hour earlier in reaching the channel they could have steamed unobstructed over a veritable "open sea" to the Pole itself. We know that they did not succeed, but were forced to winter almost within sight of this sea, and subsequently, disheartened by the loss of their gallant commander, abandoned the enterprise.

Where this open water was found, Captain Nares in 1875 and 1876 found solid, impenetrable ice, through which no vessel could force its way, and over which it was equally impossible for sledge parties to work.

These facts appear to show that within the Arctic circle the seasons vary as markedly as in more temperate southern latitudes, and that the icy barriers to the Pole are sometimes broken up by favoring winds and temperature. To reach the Pole prompt advantage must be taken of such favoring circumstances, and to do this with the greatest certainty and with the least expenditure of time, money, and human life, it is essential that the exploring party be on the ground at the very time the ice breaks up and opens the gate-way to the long-sought prize. This can be done only by colonizing a few hardy, resolute, and experienced men at some point near the borders of the Polar Sea, and the most favorable one for the purpose appears to be that where the Discovery wintered last year.

Such a party should consist of at least fifty men, and should be provided with provisions and other necessary supplies for three years, at the end of which period they should be visited, and if still unsuccessful in accomplishing the object, revictualled and again left to their work. Captain Hall spent eight years among the Esquimaux, and each year found himself better fitted to withstand the severity of the Arctic circle, and the party of which I speak would in like manner become acclimated, and eventually succeed in accomplishing the long-desired end. With a strong, substantial building, such as could easily be carried on shipboard, the party could be made as comfortable and as safe from atmospheric dangers as are the men of the signal service stationed on the summits of Pike's Peak and Mount Washington, or the employés of the Hudson's Bay Company stationed at Fort York, where a temperature of —60° is not uncommon. A good supply of medicine, a skillful surgeon, and such fresh provision as could be found by hunting parties would enable them to keep off scurvy and to maintain as good a sanitary condition as the inhabitants of Godhaven, in Greenland. Game was found in fair quantities by the Polaris party on the Greenland coast, and by those from the Alert and Discovery on the mainland to the west, especially in the vicinity of the last-named vessel, where fifty-four musk-oxen were killed during the season, with quantities of other and smaller game. A seam of good coal was also found by the Discovery's party, which would render the question of fuel a light one, and thus remove one of the greatest difficulties hitherto found by Arctic voyagers.

The principal depot or post should be located upon Lady Franklin Bay, between latitude 81° and 82°, and there is no question that this can be reached with a steam vessel, as Captain Hall went as high as Cape Union, between latitude 82° and 83°, with the Polaris, and Captain Nares still higher with the Alert. It is probable that the last-named point may be reached with the vessel, in which case coal and provisions could be deposited there to form a secondary base of operations for the exploring party. If this latter can be done, the road to the Pole will be shortened by about ninety miles in distance and three weeks or more in time, two very important items. It should be clearly understood that the only use to be made of the vessel, which it is hoped will be obtained from the Navy Department, is in the transportation of the men and supplies to the location of the colony. When this is done the vessel will return to the United States and await further instructions. An annual visit might be made to the colony, to carry fresh food and supplies, to keep its members informed of events occurring in the outside world, and bear them news and letters from anxious relatives; to bring back news of progress made and of a private character to friends; also, if necessary, to bring back invalided members of the expedition, and carry out fresh colonists to take their places. The permanent colony should consist of fifty chosen men, mustered into the service of the United States, three commissioned officers, and two surgeons; all to be selected with a view to their especial fitness for work, the young, able-bodied, resolute men, who can be depended upon to carry out instructions to the extreme limit of human endurance. An astronomer and two or more naturalists, to be selected by the National Academy of Sciences, and to work under instructions from that body, but subject to such general supervision and direction from the head of the expedition as is customary at all posts in charge of an officer of the United States, should accompany the expedition. One or more members of the regular force should be competent to make meteorological observations, and to communicate by telegraph and signals whenever such communication becomes necessary.

To the expeditionary corps brought from the United States should be added a number of Esquimaux to serve as hunters, guides, etc., and who can be taken over with their families from Disco or Upernavik, in Greenland, and also an ample number of the Esquimaux dogs, so indispensable for sledging and so useful as food when their capacity for work is gone.

The outfit of the expedition should include some two hundred miles or more of copper wire, to connect the colony at Lady Franklin Bay with the subsidiary depot at Cape Union, and thence northward as far as practicable. Copper wire is strong, light, flexible, and a good conductor, and can be worked while lying upon the dry snow or ice without support. The necessary battery, material, and instruments should be taken to equip the amount of line, and the battery could be kept permanently at the Bay station, where, fuel being abundant, it could be kept from freezing. A few sets of signal equipments, such as are used in the army signal service, would also form an indispensable part of the outfit, and all of the men should be instructed in their use and in the signal code. Thus provided with means of communication the sledging parties could move forward with confidence, as they would be able, when necessary, to call upon their comrades who remained behind for advice or assistance. Instead of discouraging further effort, the failure of Nares's expedition from the causes named should stimulate fresh endeavors, and hold out a fair prospect of success. At any rate, the little colony on Lady Franklin Bay, during their three years' residence, besides having the opportunity of selecting an open season and becoming thoroughly hardened and acclimated, would have their work narrowed down to a common focus, — the pathway due north. The work of the Nares expedition clears the way for a direct movement upon the Pole. The explorations westward along the coast by Lieutnant Aldrich, and eastward by Lieutenant Beaumont, obviate the necessity for similar work now. Upon landing and unloading, the stores and provisions quarters should be erected, and the vessel, returning to the United States, would leave behind her a thoroughly equipped, self-supporting, and self-reliant colony which would push, ever northward, the limits of discovery.

The attempt to draw the loaded sledges by means of mere manual labor should not be made unless it should become in any particular instance a matter of absolute necessity, as it is sure to result disastrously, and seems to have been one of the causes of failure of the Nares expedition. The expedition from the colony to the Pole may consist of eight sledges, with six men to each sledge, the distance to be traveled being some four hundred miles, divided into eight stages of fifty miles each. At the end of the first stage one sledge could be sent back. A portion of the provisions which it originally carried would have been consumed, and the rest would have been deposited in a *cache* in the ice secure from Arctic animals. At the end of the second stage the second sledge would be sent back; at the close of the third stage the third sledge would take up its homeward journey, and following out this plan only a single sledge would remain. The returning sledges being but lightly freighted, and traveling, moreover, a route already pioneered, several of their hands could be retained so as to man the eighth sledge with ten or more explorers. This last sledge with its full complement would perform the most important work of all. It would press forward, reach the Pole, make the necessary observations, and then return. Upon its homeward journey it would follow the route already made in the forward journey, and would find provisions at each successive cache.

During the summer there are probably long lanes of water free of ice from the upper end of Smith's Sound, and following these, against the downward-flowing current, a pathway will surely be found, practicable for boats, during some favoring season. Such favoring season and such a practicable pathway can be found only by men colonized as proposed at a point where — half the journey already safely completed — they will be ready, healthy, vigorous, acclimated, and unwearied by a long and perilous voyage; they will be ready and eager to seize the proffered opportunity. Failing such an opportunity, a chance barely possible, the alternating of sledge journeys still remains, and sledge journeys undertaken under better and more favorable auspices than any which have been as yet attempted.

The severity of the climate on Lady Franklin Bay and in the neighboring regions has been much exaggerated. To parties under cover it is not more trying than that at the summits of Mount Washington, in New Hampshire, or of Pike's Peak, in Colorado, as stated by a former member of one of Dr. Hayes's expeditions, who has since served a year upon the summit of the last-named mountain. The report on the Polaris expedition shows that during the summer all the lowlands and elevations at Thank God Harbor (opposite Discovery Harbor on Lady Franklin Bay) were bare of snow and ice, excepting patches here and there in the shade of the rocks. The soil at that period was covered with a vegetation of moss interspersed with small plants and willows. The country abounds with life: seals, game, ducks, musk oxen, rabbits, wolves, foxes, bears, partridges, etc. Two seals were shot in the open water.

Again, there are several towns in Northern Asia inside the Arctic circle, and a flourishing city of Russia (Archangel) is not far from it. At Yakutsk, on the river Lena, the ground is frozen solid all the year round, and only thaws a few inches in depth during the hottest summer. Yet this is a town possessing a population of four thousand hardy, prosperous, and contented human beings.

Nostalgia, that dreaded foe of isolated men, found in the members of former exploring parties an easy prey through the long, sunless, Arctic night, and drove some to mutiny and others to suicide, while when the hour of deadly peril came — the supreme moment of despair — the stoutest heart was appalled by the knowledge that succor, if sent at all, must be guided by the merest chance, and that the rude cairn which covered his last resting-place or his frozen effigy upon some drifting ice floe might never meet the gaze of human eye. The new enterprise will go forth under far different auspices to seek a definite rendezvous from which every forward step will be duly chronicled, and the members of the expedition, well knowing that communication will be kept up for their aid, comfort, and supply, will strive with a keener endeavor for the long-coveted prize. Speaking of his expedition in 1861, Dr. Hayes says that the crew were always, and had been, in perfect health; that he was his own ship's doctor, and a doctor without a patient, and that, "believing in Democritus rather than Heraclitus, they had laughed the scurvy and all other sources of ill health to shame." Nor is the danger of Arctic exploration so great as it at first thought appears to be. A distinguished naval officer who has served in those regions states that "of all the seas visited by men-of-war the Arctic have proved the most healthy;" and Mr. Posthumus states, further, that since 1841 England and America have sent out thirty-two expeditions, the total number of deaths from which has been only thirty-eight men, or 1.7 per cent., a percentage which would appear much more favorable if the expeditions of the Germans, Swedes, and Norwegians were included.

To sum up, then, in brief: It is proposed to ascend a well-known and practicable channel to an equally well-known point where exploring parties have previously wintered, and there form a colony. From the post so formed no time will be spent in needless quests along the shore either east or west, as surveys there have already been completed; but starting afresh, the point of our beginning being the closing point of former expeditions, with all the information of our forerunners to commence with, better provisioned, equipped, and disciplined, with better means of intercommunication, thoroughly acclimated, and without the refuge of the ship to paralyze energy and sow the seeds of discontent and slothfulness. In other words: to use alike the partial successes and the partial failures of others, added to the utmost foresight, experience, and scientific aids to form the fulcrum of the Archimedean lever which shall move the Arctic world.

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RECENT LITERATURE.

WALLACE'S GEOGRAPHICAL DISTRIBUTION OF ANIMALS.[1] — Although a complete work on this subject by a single writer — and the one under consideration applies, as the author intended it should, almost exclusively to land animals of a comparatively few orders — would in the present state of our knowledge be an impossibility, we know of no one, next to Mr. Darwin, who is better fitted for the task, by training both in the field and in the study, than Mr. Wallace. The work is comprehensive in scope and apparently accurate in details, while the subject is presented in the attractive, clear style of the distinguished author of the Malay Archipelago and the Contributions to the Theory of Natural Selection. It is written, as it should mainly be, in the light of the recent uniformitarian views in geology and the theory of evolution, though with occasional disregard of zoögeographical laws laid down by Humboldt, Brown, Schouw, Schmarda, Decandolle. Agassiz, Dana, and others whose names are not even mentioned in the work before us, no historical sketch of the subject being presented, an omission of considerable importance.

The work is divided into four parts: I. The Principles and General Phenomena of Distribution. II. On the Distribution of Extinct Animals. III. Zoölogical Geography; a Review of the Chief Forms of Life in the Several Regions and Sub-Regions, with the Indications they afford

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[1] *The Geographical Distribution of Animals. With a Study of the Relations of Living and Extinct Faunas as elucidating the Past Changes of the Earth's Surface.* By ALFRED RUSSEL WALLACE. In two vols. With Maps and Illustrations. New York: Harper & Brothers. 1876. 8vo, pp. 503, 607. $10.00.